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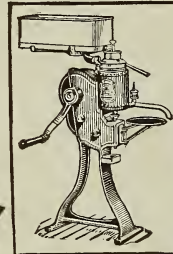
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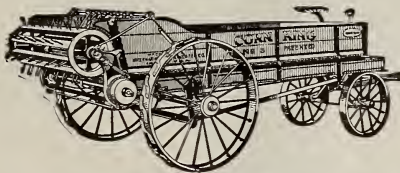
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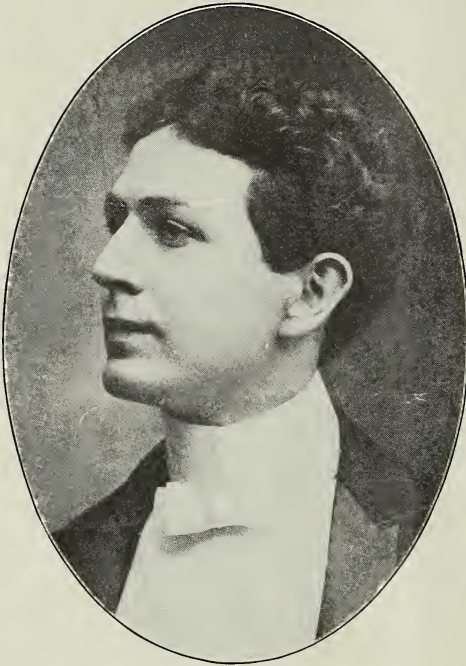
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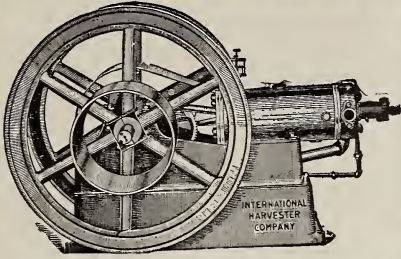
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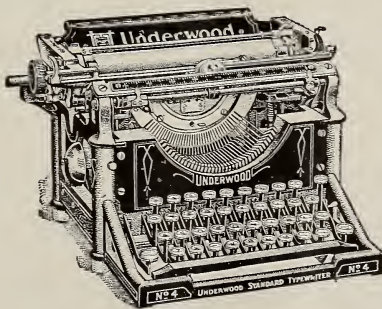
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March, 1909.

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Ohio.

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PLANTING THE ORCHARD

H. S. Thompson, Assistant in Horticulture at the Ohio State University

Among the first things to be considered in planning an orchard are the selection of a location and the selection of varieties. In making the selection of a location we should consider the transportation facilities, topography of land, kind of soil, drainage, etc. Flat, black land such as we find in many parts of Ohio is not suited for growing apples because of the lack of good air and water drainage, especially the former. This kind of soil produces too much wood growth at the expense of fruit production. While fairly fertile land should be used, apples will do well on land that will not produce good crops of corn, wheat, oats, etc. Much of the hilly, rough land of southern Ohio gives excellent results in growing fruit. The best land for apple growing is that which is rolling or even hilly, provided it is sufficiently fertile to produce a good growth of trees.

Having selected the location the very important problem of selection of varieties comes up, and the selection made should depend upon whether a commercial or home orchard is wanted. In selecting for the commercial orchard we would select varieties that would not be selected for a home orchard. In the first case we select the varieties that will give the best financial returns without much reference to the quality of the fruit, while in the latter case we would select varieties that suit our taste the best, even if they were not good bearers and well suited to our location. For central and southern portions of Ohio the best commercial summer variety is the Yellow Transparent and it would also be selected for a home orchard for the quality of the fruit is good.

Early Harvest, Benoni, Duchess and a few others are being planted to some extent for summer varieties. The best fall varieties for this section are the Wealthy, Snow, Grimes Golden, Maiden Blush, Fall Pippin. In some sections the Maiden Blush and Wealthy are classed as summer apples, and in other sections the Grimes Golden is classed as a late fall or winter apple. When we come to the selection of winter varieties we have a larger list of good commercial varieties to select from, but for the above section the best commercial varieties are: Rome Beauty, Stark, Jonathan, Wagner, Gano, York Imperial, Mann, Fallawater. Probably Staymen's Winesap, Ben Davis, Smith Cider and a few others might be added. If the selection was being made for the northern part of the state, Baldwin, Rhode Island, Greening, Northern Spy, Canada Red, possible Cooper's Market, Sutton's Beauty and a few others might be added.

The preparation of the land for apple trees is a question that is not easily settled. If the land is hilly and washes it should not be plowed at all, as the soil will be washed away and the roots of the trees exposed. Even on land that will not wash and is in sod it is a question whether it is best to plow it or not. If land is to be put in other crops, of course, it is plowed, but this should never be done except on good strong land, then the crop should be one that does not shade the trees or one that is a heavy feeder. One of the finest orchards in Ohio was planted in sod that had been standing for years and it has never been disturbed since. Large holes were dug for the trees and

mulch was put around them very soon after planting.

The question of the distance of planting is also one that is receiving considerable attention now and the tendency is to plant much closer than formerly. A few years ago trees were planted 30 by 40 feet, 35 by 35, and even 40 by 40, but now some of the best orchardists are planting as close as 20 by 20 feet apart each way and in the West even closer than that. A very good, and perhaps the best method is to plant the permanent trees about 30 by 40 feet apart and plant fillers or temporary trees in between in the 40-foot way. Some good orchardists plant their permanent trees 40 by 40 and plant fillers in between both ways, making the trees 20 by 20. For the fillers small growing, early bearing, early maturing trees should be selected. The Yellow Transparent, Wealthy, Maiden Blush and Wagner are good fillers. As soon as the fillers begin to crowd the permanent trees they should be cut out and the success of this method depends upon the growers' courage to cut out these fillers before they injure the permanent trees. By the filler method we are able to get 8 or 10 crops from the temporary trees without any appreciable injury to the permanent ones and it is sometimes said that this causes the trees to bear younger, because of the roots filling the soil sooner.

Sometimes peaches are grown between the apple trees and the method has some advantages over the other method, but great care must be exercised in spraying, for the spray used for apple trees will injure the peach trees. The one great advantage of this method is that the peach trees will have done their duty before the apple trees are large enough to crowd, and the orchardist will not have to cut out trees

that are producing good crops as he would have to do in the apple filler method.

If the trees are to be planted in plowed land a very good method to follow in getting it ready for the trees is to stake off the rows and plow a furrow as deep as possible with a turning plow, throwing the furrow both ways, then shape the bottom of the furrow with a shovel so as to accommodate the roots. If the planting is done in sod land the land is laid off and a stake set for every tree and the holes are dug larger than in the former method. In preparing the trees for setting they are pruned back to two or three scaffold branches, which should be selected with great care for they form the future top of the tree. The height of the crown will depend upon the height of these scaffold branches. The roots are pruned to conform to the top and all broken or mangled roots are removed.

The care of the orchard for the first year depends upon the method of preparation of the land for the trees. Where the sod method is followed the trees should be mulched immediately after planting and the grass growing between the trees is cut and left lie or is brought up around the trees but should never be taken off. In the clean culture method mulching is very desirable and is followed by most good orchardists at present. The one great objection to the mulching system is that the mulch furnishes a good place for the harboring or rodents which eat the bark of the young trees. The trees should be protected in some way and the mulch is raked away a short distance from the trees in winter. A fairly reliable and cheap method of protection is to build up a cone of earth around the base of the tree, or to use coal ashes where they are available. Trees are often pro-

tected by a wire screen and this is the safest method but is more expensive than the other methods mentioned.

Another good method of treatment for the young orchard is the cover method. Where possible some leguminous crop is the best crop to be used because it adds nitrogen to the soil. Soy beans, clover, vetches or alfalfa are good. The cover crops add humus to the soil, protect it from freezing very deep, hold the leaching nitrates, hold the snow

and rains until they have time to soak in and by taking moisture in late summer and fall cause the trees to mature their wood early—thus preventing winter killing. These cover crops are planted about midsummer, when the trees have most of their growth so as not to interfere with the growth of wood. The system to be followed depends upon the conditions of environment.



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OHIO VS. THE PACIFIC NORTH-WEST FOR FRUIT

By Lowell Roudebush

What are some of the essentials in profitable fruit raising? First a market at home and abroad for the surplus. What state will compare with Ohio in this? Certainly not California, Oregon, Washington or Idaho. Ohio has more high priced laborers within her borders than all of these. There are no consumers to be compared with them—they have both the money and the appetite. Not only has Ohio an ideal home market but near at hand a foreign. The Pacific Northwest has not the former and is from two to ten thousand miles from the latter. Then she has in fact no market anywhere except for extra fancy. Of this there is always a dearth in most orchards—lack in size, color and perfection. You may have a market yet for want of cheap, rapid and safe transportation lose out. In this Ohio is most fortunate. With water on the northern and southern boundaries, good roads everywhere and numerous traction and steam roads with their many branches extending beyond her confines. Who can get a home or foreign market as she? If Ohio orchardists had the money paid for transportation by our Pacific Coast friends they would be paid for their fruit. Ohio soil is not lacking in the elements that give quality, size, color and perfection to the fruits. She has more limestone than they or any other state save one. Does volcanic ash compare with it in these? Ohio with its diversified surface gives ideal air and water drainage to a large area.

Ohio fruit lands range in price from \$7 to \$100 per acre. In the Pacific Northwest from \$350 to \$2000 with

rates of interest much higher than here. As to insect pests and fungus diseases they have all that we do which is true from the Rogen River Valley on the South to the Wearatchee on the North. In a few inaccessible valleys the plum curculio and codling moth have not appeared. There trees must be sprayed to insure perfect fruit. If their trees do come into bearing sooner, for each year you gain in the start you lose three on the homestretch. They are very short lived. Are the fruits of as good quality? No, not at all; but they look like they were and looks count in the market. In size they are much larger than those of the same variety as they are ordinarily grown by old-time methods. This increased size and high color is at the expense of quality. This extra size is obtained by thinning which Ohio growers do not practice with the apple. How do you reconcile your statement that they lack in quality with the fact that they bring more in the market than those grown in Ohio. In net results to the producer it is a mistake. Again all is not gold that glitters. The high prices paid by the consumer for Pacific Coast fruits is because of their more intelligent methods in pruning, spraying, thinning, picking, grading and marketing. Naturally their orchardists are no more intelligent, industrious and honest than those of Ohio. Environment has made and forced them to appear so at least. With no home market and a foreign one two to ten thousand miles away, this has forced them to do as well as they know how. Thus it is that their profits are because of our stupidity; our indif-

ference, our negligence in setting trees or varieties not adapted to our soil, climate and markets. In not pruning more practically, spraying more carefully, thinning more intelligently, grading and marketing more honestly. They are planting a hundred trees to our one in proportion to orchard acreage. In short tree planting in the Pacific Northwest is being overdone. Prices this year indicate it. If we of Ohio

will only do as well as we know how in the essentials, Ohio will lead her sister states in the successful and economical production of all the fruits in size, color, quality and keeping because of her sunny skies, cheap lands, fertile soils, air and surface drainage and an ideal home market with a foreign one at our doors. Ohio is good enough for me.

GROWING STRAWBERRIES ON THE FARM

E. P. Snyder

Not one farmer in ten supplies his family with an abundance of strawberries.

It is not at all uncommon to hear farmers say, "We have no time to bother with strawberries. We can buy them cheaper than we can grow them." Both of these propositions are untrue. It takes very little time if one goes at it right and if any farmer ever did buy his family all they would eat through the season he'd be surprised at the cost and I've noticed that the families of the men who stoutly make these assertions mostly get along without strawberries.

If a man had a disposition to buy strawberries instead of growing them not many are so located that they can conveniently do it, and when they do buy them they are not nearly so fresh and nice as when picked from the vines at home.

I am willing to admit that the argument, "Lack of time to grow them" has some force, but if the planting and tending is done in time, and the bed so arranged as to make the most of horse work, the cost of time and labor will count for little compared with the value of an abundant supply of the most delicious fruit that grows.

Any ground that will grow corn and potatoes will grow good strawberries.

Lay out good long rows so the tending can be largely done with horse and cultivator. Thoroughly fit the ground and plant as early in spring as the ground is in good condition. Lay the rows out four feet apart. Set the plants two feet apart in the rows. Cultivate once a week and let them cut the runners. Just let them spread themselves and they'll do it too. Keep running the cultivation through the whole season, it will take but little time and then you will have a path between the rows that will be found a great convenience in picking.

In choosing varieties don't be misled into paying fancy prices for some much lauded new varieties. Get some of the old standards like Bubach, Haviland, Brandywine, etc. If you get any of the imperfect flowering varieties be sure to set perfect varieties with them.

Mulch with clean straw as soon as the ground freezes in November. Rake part of the mulch off the rows into the paths in the spring, leaving enough on the plants to protect the berries from grit and you will be surprised when you are picking the great delicious, ripe, red strawberries that they have cost you so little of time and labor and money and you'll bless the day that you started in to grow strawberries for home use.

THE FARMER'S GARDEN

Prof. V. H. Davis, Ohio State University

While the location of the commercial garden is carefully selected with reference to soil, drainage, slope of the land, etc., the location of the home garden is fixed, within very narrow limits, by the location of the home. A garden full of all the good things possible for it to contain a half a mile or a mile from the house will be a great inconvenience, to say the least, to the already over-worked housewife.

Give the garden a prominent place among the home surroundings. I am perfectly aware that there usually is a very good reason for placing the average garden out of sight if possible. But if placed where it can be readily seen from the porch and the passers-by, our pride will be touched, better care will be given, better crops grown, and the garden will become a veritable summer resort, where we will delight to take our friends.

While the location is fixed by the home, if there is any opportunity for choice, select a southern slope with a deep, well drained sandy loam soil. If not thoroughly well drained naturally, tile will correct the difficulty. If the soil is too heavy a liberal application of sand, coal ashes, or stable manure will make it looser and quicker. If too sandy plenty of organic matter will correct this trouble to some extent. Plant food can be added in the form of stable manure or commercial fertilizers.

More satisfactory results will invariably be secured if a definite plan is worked out before hand and drawn to scale upon paper showing just where each crop is to come and the exact space it is to occupy.

The old fashioned square garden with its little patches of plants here and

there does not conform to our modern ideas of what the garden should be. Where space is limited it must be used as found, but where plenty of land is available the garden should be at least twice as long as wide and the rows run either the long or the short way. The long way makes cultivation much easier, but the short way gives easier access to the various crops. Beginning at one side place a row or part of a row of grapes, then currants and gooseberries, followed by raspberries and blackberries. Follow these by asparagus, rhubarb, strawberries. The taller growing annual plants should then be planted, as corn, pole beans, tomatoes, cabbage, potatoes, beans, etc., and finally the small stuff, as radishes, lettuce, parsley, etc., should come nearest the entrance from the house.

Wherever possible select twice as much ground as desired for the garden proper and rotate the crops, growing clover on one part one year and vegetables the next. In any case a rotation of the crops should be provided as far as possible. It is rarely advisable to grow the same crop on the same area twice in succession if it can be avoided. The modern planter and the wheel hoe have done more than anything else to eliminate the drudgery in connection with gardening. At present a garden properly laid out, prepared, and planted can be cultivated much better with these modern tools than by the old ways and with one-fourth the labor.

The best results cannot be secured by the close and double methods of cropping, that should not be followed, without a very liberal use of manures. The amount of fertilizer that can be profitably used on the garden, as compared

with the amount that can be profitably used on the common farm crops, is something enormous. Fifty to one hundred tons of stable manure per acre is not an uncommon amount to use, and from 1000 to 2000 pounds of high grade commercial fertilizer is oftentimes applied. One particular form of fertilizer deserves special mention in connection with the garden. It is nitrate of soda. This material is readily soluble and is immediately available to the plants. If used upon very early crops, especially those grown for their foliage, as lettuce, cabbage, etc., the results will often be remarkable. Being so readily soluble and easily washed out of the soil, it should be applied at intervals in such quantities as the plants can readily use. One hundred to one hundred and fifty pounds per acre applied to the growing plants every two or three weeks will usually give best results. Apply broadcast when the plants are dry or just before or during a rain.

Purchase the seed for the garden of a reliable seedsman and be willing to pay a good price for them. Poor seeds are dear at any price. Above all things don't purchase the supply of seeds from the hardware store or the corner grocery. Such seed may sometimes be satisfactory, but the probabilities are that it will not be. Wherever the seeds are secured they should be tested for both purity and vitality before planting. The purity is determined by taking a given weight of the seed, carefully separating out all chaff, sand, broken seeds, weed seeds, etc., reweighing the pure seed and computing the percentage of impurities present. The vitality of the seed may be tested in a number of ways. Perhaps the simplest method is to fill a box of convenient size with clean sharp sand. Divide the surface into areas of desired size by stretching strings or wire in

both directions across the top. Place 100 seeds of the samples to be tested in each of these squares then cover with a cloth upon which a half inch of sand is placed and the whole thoroughly moistened. Place this box in the temperature of the ordinary living room and count the seeds sprouting each day for ten days. The number of the per cent. germinating multiplied by the percentage pure equals the real or the intrinsic value of the seeds. The following is a list of the kind and quantity of seeds required to plant and crop one-third of an acre to the best advantage. This list may be varied both in varieties and amount to suit the tastes of the family:

One quart peas, Alaska or First of All; 1 quart peas, Gradus or Prosperity; 2 quarts peas, Everbearing; $\frac{1}{4}$ pound spinach, Viroflay or New Zealand; 1 packet celery, Golden Self Blanching; 2 ounces onion, Weathersfield, white or red; 1 ounce onion, Prize Taker; 3 quarts onions, white sets; 1 packet cabbage, Jersey Wakefield; 2 packets cabbage, Flat Dutch; 1 ounce beets, Crosby's Egyptian; 1 ounce beets, Detroit Red; 1 packet carrots, Ox Heart; 1 packet carrots, Danvers; 1 packet pepper, Ruby King; 1 packet pepper, Long Cayenne; 1 ounce parsnips, Hollow Crown; 1 packet egg plant, N. Y. Purple or Beauty Red; 1 packet tomatoes, Earliana; 2 packets tomatoes, Stone; $\frac{1}{4}$ pound radish, French Breakfast; 2 ounces radish, Cinc. Market, Chantierre or Icicle; 1 packet radish, White Chinese; 3 packets lettuce, Grand Rapids; 1 packet lettuce, Big Boston; 1 packet cauliflower, Ey. Snowball; 1 packet cauliflower, Dry Weather; 1 packet Hohl Rabi, Ey. White Vienna; 1 pint beans, Ey. Red Valentine; 1 pint beans, Refugee Wax; 1 pint beans, Henderson's Bush Lima; 1 pint beans, Kentucky Wonder; 1 pint sweet corn, Ey.

Cory; 1 pint sweet corn, Country Gentlemen; 1 pint sweet corn, Columbus Market or Stowell's Evergreen; 2 ounces cucumbers, Long White Spine; 1 ounce musk melon, Tip Top; 1 ounce squash, White Bush; 1 ounce squash, Hubbard; 1 ounce squash, Fordhook; 1 packet parsely, Moss Curled; 1 ounce salsify, Mam. Sandwich Island; 1 packet turnips, Purple Top White Globe; 1 packet Ruta Baga, Golden Heart; $\frac{1}{2}$ bushel potatoes, Ey. Ohio; 100 sweet potato plants; 250 strawberry plants, Haverland, Senator Dunlap, Bubach; 50 asparagus plants, Palmetto; 12 rhubarb plants, Sinnaeus; 12 gooseberry plants, Downing; 12 currants, Victoria; 50 raspberries, King, Cuthbert, Cumberland, Kansas; 25 blackberries, Snyder, Eldorado; 10 grapes, 2 Concordi, 2 Moor's Early, 2 Worden, 1 Catawba, 1 Niagara, 2 Delaware.

The value of the vegetable garden may be greatly increased by the use of hot beds and cold frames during the late winter and early spring months. The hot bed is easily made and easily cared for and the wonder is that it is not more commonly used. Fresh horse manure from the barns is the best material to use as a source of heat. The clean manure should be mixed with about one-half its bulk of fine straw or leaves, piled into square piles three or four feet high, five or six feet wide, and as long as desired, under cover if possible. In a few days, fermentation or heating will begin, when the pile should be forked over, working the outside of the old pile to the inside of the new. After heating is again well under way the material is ready for use. A well drained location, level or preferably sloping to the south should be selected. A trench should be dug about six and one-half feet wide,

two feet deep, and as long as desired. This trench is then filled with the prepared manure, spreading it in thin even layers and thoroughly tramping or compacting until level with the surface of the ground. The bed is then ready for the frame, which is made in the following manner: A board twelve inches wide, six feet long and preferably two inches thick is used to make the end pieces for the bed, by measure down from one edge at one end three inches and in the other direction to the middle of the board. Saw off this triangular piece and turn it around and spike it to the other end. This makes the end pieces nine inches high on the front or south side and fifteen inches on the north or rear side. The side boards should be of the same material and as long as desired, but always some multiple of three. Within the frame place about six inches of good garden soil directly upon the manure and cover with hot bed sash six feet long by three feet wide. The heat will be intense for a few days but will soon fall to 80 or 90 degrees when the seed can be safely planted. The beds should be ventilated by raising the sash a few inches on the high side every day, except during very stormy weather. Such a bed will retain its heat for seven or eight weeks and if started the middle of February, fresh radishes, lettuce, spinach and other crops can be secured ready for the table by the time the seed could be planted out of doors. A bed twelve or fifteen feet in length will usually be of sufficient size for the growing of early crops and plants for the average farmer's garden. During very cold weather some cover other than the glass will be necessary; shutters, mats, hay or straw are oftentimes used.

THE NURSERYMAN AND HORTICULTURE

N. E. Shaw, State Nursery and Orchard Inspector

No other two branches of Agriculture are so closely connected and dependent, one upon the other, than are the nursery business and horticulture. While the nurseryman does not usually rely on the horticulturist for the output of his entire product, there are very few of them who do not depend on the fruit grower for the greater portion of their trade, and few are the orchardists who do not at some time in their experience, directly or indirectly, secure their plantings from the nurseryman.

Where two businesses are so closely related, it is very necessary that a perfect understanding should exist between all concerned. The orchardist should realize that the great majority of nurserymen are not working in the dark in order to defraud them. There are no secrets in the growing of nursery stock today, but what most nurserymen will gladly explain to any interested purchaser. The same condition of soil, climate, fungi and insects that confront the fruit grower are also his, and quite often to a greater degree of intensity. Before his product is ready for the market, it must run for several years, a gauntlet of drouth, hail storms, rodents, insects and many other pests. It is here that some nurserymen are tempted to dispose, by any possible means, all stock of whatever quality which has arrived at the marketable age, and the business as a whole suffers from such acts.

It is good business policy, on the part of the nurseryman, to supply his customers with stock of such honesty and quality, that their trade may be secured for future plantings. Nothing has done more harm to the horticultural

interests, and likewise to the nursery business, than putting on the market inferior, misnamed and poorly handled stock. Insects and diseases can be fought and controlled, but the disappointment experienced when trees begin to bear fruit of varieties entirely different from those which had been expected, is a blow from which the orchardist does not easily recover, and never forgets. Thus is the progress of horticulture greatly retarded in communities where such cases occur. So great have been the discouragements of some growers, that they have adopted the practice of top-working their young orchards, or of propagating their own stock.

Mistakes will occur in the best regulated nurseries, and varieties will become mixed. This is not, in all instances, the fault of the nurseryman, and is to a certain extent unavoidable. The best plan is to select men of known reputation, place the order with them and request that mistakes of the above nature be rectified by replacing or refunding, and but few of them will fail to do so.

Conditions under which nursery stock is grown have been changing. Pests of all kinds have multiplied, and stock cannot be produced as cheaply as in former years. If the orchardist is not willing to pay a fair price for trees which will be with him for a life-time, he cannot expect trees of the best quality, and he may rest assured that the nurseryman can be found with goods that will match his price in value. Pay well for good stock where it is known that honest service will be secured, but do not pay high prices to unscrupulous

agents and then receive goods of inferior quality. It is men of this class who are largely responsible for the adverse feeling entertained by many fruit growers towards the nurserymen.

Horticulture is indebted to the nurseryman for many valuable new fruits and plants. In fact we rely upon him almost entirely as a source for new creations in horticultural lines. Occasionally his zeal for financial gain leads him to place on the market new varieties of little and untried value, but it is for the horticulturist to stamp such goods with his disapproval.

Nurserymen have been responsible for many insects and diseases which have become established pests in many localities. While they may not have

used sufficient care in these matters, many pests have thus been introduced without their knowledge. On the other hand, their vigilance has often prevented the introduction of many other serious enemies of the fruit grower, and quite often at serious financial loss to the nurseryman.

As a class nurserymen are square business men with their share of troubles to contend with. Their zeal in placing their product on the market has led to some objectionable methods, but the planting of trees of the right sort can never be overdone, and for furnishing an abundant supply of these goods, tree lovers in general should thank them.

SPRAYING

Wm. Miller

In the days of our fathers orchard trees grew to maturity and bore fruit without special care. But with the increased area devoted to their culture, and bringing trees from all parts of the world, all the insects and diseases to which fruit trees are subject have been brought with them. So abundant have they become that the fruit grower must learn how to combat them or quit business.

It is scarcely twenty-five years since spraying with copper salts was first suggested as a preventative of fungus troubles of vines and trees and arsenical solutions for lessening the damage caused by insect attacks.

Manufactures were slow to recognize the needs of the fruit grower and only in very recent years have suitable pumps and appliances been available. While repeated demonstrations showed the necessity of spraying, it was only after

the advent of the San Jose scale that it was generally recognized as essential to successful fruit culture. The appearance of this insect at first regarded as a calamity, has proved a boon to the fruit grower. It has brought us suitable machinery, and compelled a study of methods and materials necessary in combating both insect pests and fungus troubles. It has taught the fruit grower to think more, stimulated his knowledge of Botany, Chemistry and Entomology, besides giving him boundless opportunities for hard work. All hail the scale! Fruit growers and consumers should unite in commemorating its advent.

The fact that spray we must is settled. The unsettled points, how to lessen cost and get the best results, remain to be considered. Spray literature is plentiful in Exp. Station bulletins, calendars and pump catalogues. One can easily

learn the how, the why, the when. No best preparation or best method has been devised.

We only tell how we do in our own practice this year, hoping for better plans for another year. We make our own lime sulphur solution. Some of the commercial preparations are effective and will come into more general use when a law regulating their strength and purity is passed. The outfit for preparation of spray material in common use in the larger peach orchards in this vicinity consists of a ten-horse power boiler—threshing engines often used—power pump, elevated tank for a water supply, another just below which is piped for live steam for cooking and still another tank below that from which the wagon spray tank is loaded. All so placed that gravity will convey until the wagon is reached. An air compressor so placed as to be run with steam or other power.

The spraying outfit consists of wagons on which are mounted two galvanized steel tanks holding 130 gallons each. One of these is filled with the liquid to be used and into the other air is compressed to about 175 pounds pressure. These go to the orchard without pump to corrode and get out of order. With no tired man working a pump handle, or gasoline engine to get balky when most in a hurry. Open a valve connecting the air and liquid tank and the steady even pressure is maintained without further work or attention. Two men doing the work requiring three with any other outfit. By the time the tank is empty the boy drawing the second tank has arrived. The hose is changed and the work progresses without delay. The first tank returns with about 80 pounds pressure remaining in the air tank. The compressor is attached and started, and by the

time the liquid tank is refilled the air tank is recharged. There are fifteen or twenty plants of this kind within a radius of ten miles of my home, most of them co-operative, owned by half a dozen or more fruit growers. The members own their own wagon outfits while the cooking plant and compressor are company property. Not one of them would be willing to go back to gasoline, traction or hand pump outfits.

This kind of a plant is only adapted to work in large orchards. The owner of smaller orchards can readily find outfits meeting his needs and at prices to fit his purse. All have been greatly improved in recent years and no really poor ones are now on the market. A pressure guage should be attached to every pump and a pressure of a hundred pounds or more should be maintained, to do good work. As soon as freezing weather is over, usually about the last of March, we spray every fruit tree, vine and shrub with a 15—18—50 solution of lime sulphur for the San Jos scale. This pest has become so prevalent that the fruit growers should cease to look for it, but spray every tree or plant upon which it thrives. The good resulting other than that of killing scale will repay all its costs. Early spraying will also prevent leaf curl upon peach foliage, but if delayed until the buds are swelling, while just as effective against scale, is too late to ward off the leaf curl.

The first spraying should cover every part of the tree from the ground to the tip of branches. This can not be thoroughly done if the wind is blowing, so we spray three-fourths the way around returning as soon as there is a change of the wind to finish.

While we regard lime sulphur as just as good a fungicide as Bordeaux, authorities disagree as to that, and where

apple scab is prevalent it would be safer to apply Bordeaux just before the blossoms open and after cluster buds break.

To do most effective work against coddling moth requires prompt work as soon as the petals fall. For this spraying this year we will use arsenate of lead only, three pounds per hundred gallons of water, using a coarse nozzle and spraying from a tower so as to drive the liquid down into the open calyx with great force, where the worm of the first crop of coddling moth feeds. This time trees should be drenched. Prof. Gossard of the Ohio Experimental Station claims that this spraying can be so thoroughly done that there will be no need of a second spraying. But I doubt whether this one treatment can be relied upon for all seasons and for all conditions.

If in July any wormy apples are to be seen another application should begin about August first, this time using arsenate of lead and Bordeaux applied with a fine nozzle.

In many of the strictly farming regions of the middle west the orchards are small and their owners cannot af-

ford to purchase expensive outfits for their care, nor can he afford to neglect the more important farm crops for the care of a little orchard. But the owner should not allow his trees to become a breeding place for orchard pests to the detriment of his more careful neighbors. In such cases some one should take up spraying as a business, learn how and why, provide a good outfit and go from farm to farm as threshermen do. Were spraying made compulsory and this practice became general good fruit would become more common on the farmers' bill of fare.

Insects and fungi in this country cause annual losses greater than the output of all its gold and silver mines. They cause fruit to rot, be wormy, knotty and scabby. They damage blossoms and blossom buds so as to interfere with the proper setting of fruit. They injure or destroy foliage so as to interfere with its work of building the conditions the plant must have to sustain its life, promote its growth, or form fruit buds for the following year. Those who would grow fruit must spray without ceasing.

THE AGRICULTURAL STUDENT

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MARCH

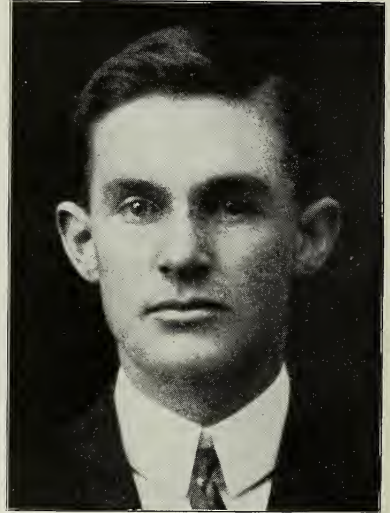
EDITORIAL

The April number of this paper will be edited by the new staff elected at the meeting of the Agricultural Society on March 3d. Mr. Heber McClelland was elected editor-in-chief, and Mr. Herbert Watts was elected business manager. We gladly step down and out and make room for those coming in to fill our places. We have served our time and if we have not taken advantage of our opportunities 'tis too late. The paper has gone on into other hands and we cannot help but feel that the society has chosen wisely in the men whom it has selected to manage its official organ.

Before we give up our privilege to "speak our mind" on this page we want to say a word to the students here in the college. We ask you to keep in mind that this paper is yours. You have just as big a share in it as anybody else, though that anybody else may be the editor himself. If the paper is not run according to your ideas of how it should be run it is your privilege and duty to inquire into the facts and, if necessary, criticise. No student paper can be a success if but two or three people are interested in it. Your questions, your criticisms will put those in charge on the lookout. They will know that their work is being critically watched and we are

sure you will be gratified by the results. Ohio's Agricultural College paper is going to be just what the students make it. Not what a few students make it, but what the whole body of students make it.

In leaving we wish to thank our readers and advertisers for their very kind interest and support.



HEBER MCCLELLAND,
Editor in Chief



HERBERT WATTS,
Business Manager

NEWS NOTES

An effort is being made to bring together and co-ordinate the various agricultural organizations in the state with a view to holding the annual meeting of all of these organizations at Columbus on consecutive dates.

During the present winter no less than five different weeks have been devoted in part to some state meeting. The Corn Improvement Association meeting was held in November, The State Board of Agriculture and the various live stock associations held meetings early in January. The State Dairymen's Association held their annual meeting the latter part of January and the State Livestock Association a meeting in February. This arrangement has necessitated four trips to Columbus for some of the men who are interested in all of these different lines of agricultural work.

A letter is being sent out to the various associations by Secretary Sandles of the State Board of Agriculture, asking them to co-operate with him in this movement.

An important poultry institute was held March 9 and 10 at the University. A small poultry show was also held. Prof. Rice, of Cornell University, and Prof. Halpine, of the Michigan Agricultural College, were the leading speakers from a distance. A number of prominent Ohio poultrymen also lectured at the institute.

La Union, a paper published in Santiago de Chile, has printed recently a picture of a parade of work horses at the University and a picture of Ohio's Crown, the champion shorthorn steer,

showed by the University at the 1907 International.

Professor Shoesmith of the Department of Agronomy has just issued a report of the First Annual Corn Show of the Ohio Corn Improvement Association. The total number of exhibits in the show was 639 of which 316 were in Class A, 10 ears of yellow corn. Of the 88 counties of the state 57 were represented by one or more exhibits.

Fayette County led all others with a total of 54 exhibits, while Licking County stood second with 41 exhibits.

The Committee on Corn Institutes and Expositions of which Professor Shoesmith is chairman, is already making plans for a bigger and better state corn show for next year, and would be glad to hear from every person interested in the improvement of corn in Ohio.

What suggestions have you to make?

A new 15-horse power electric motor, and a No. 8 Bowsher feed grinder have been purchased by the Department of Animal Husbandry and are in the milling room of the cattle barn waiting installation.

Sales of Berkshire and large Yorkshire boars and gilts have been made by the Department of Animal Husbandry, covering a territory from Wyoming to Pennsylvania. Many pigs have been sold here in Ohio, and the pure bred stock of the University is becoming widely and favorably known. A number of students or ex-students have also purchased.

THE COURSE IN HORTICULTURE AT O. S. U.

A number of changes have been made in the Horticultural course during the last two years that will be of interest to the readers of the Student and to the horticultural interest of the state.

In the first place the department of Horticulture and Forestry has been divided into separate departments. Professor Lanzeby has been made Professor of Forestry and Professor Paddock of the Colorado A. and M. College has been secured as Professor of Horticulture. Professor Paddock comes well recommended as an enthusiastic and thoroughly well trained horticulturalist, and with the hearty support of the students, faculty and board of trustees, great advances should be made in horticultural education in Ohio during the next few years.

A two year course in Horticulture has been added. This course devotes four hours through the first year to the Principles of Horticulture. Chemistry, zoology and shop work also com in this year. The second year is devoted to four hours of Pomology throughout the year. Four hours of Agronomy and not less than seven hours from any of the following subjects: Forestry, Landscape Gardening, Vegetable Gardening, Floriculture, Mathematics, Bacteriology, Geology, Physics and Botany.

This course was offered for the first time last fall and the class in the Elements of Horticulture during the fall term numbered sixty.

The four-year course has been radically changed. The work of the student as now planned will be along the four distinct divisions of the subject allowing a much more logical and con-

nected presentation of the various courses than did the former arrangement. The following is the course as it has been planned and as it has been adopted with the exception of the fourth year.

FIRST YEAR.

First Term.—Horticulture, Chemistry, Zoology, English, Drawing, Cadet Service.

Second Term.—Horticulture, Chemistry, Zoology, English, Shopwork, Cadet Service.

Third Term.—Horticulture, Chemistry, Chemistry, Zoology, Shopwork, Cadet Service.

SECOND YEAR.

First Term.—Vegetable Gardening, Chemistry, Physiology, Zoology, Botany, Cadet Service.

Second Term.—Vegetable Gardening, Chemistry, Physiology, Zoology, Botany, Cadet Service.

Third Term.—Vegetable Gardening, Chemistry, Physiology, Zoology, Botany, Cadet Service.

THIRD YEAR.

First Term.—Pomology, Agronomy, Geology, French or German.

Second Term.—Pomology, Geology, Apiculture, French or German.

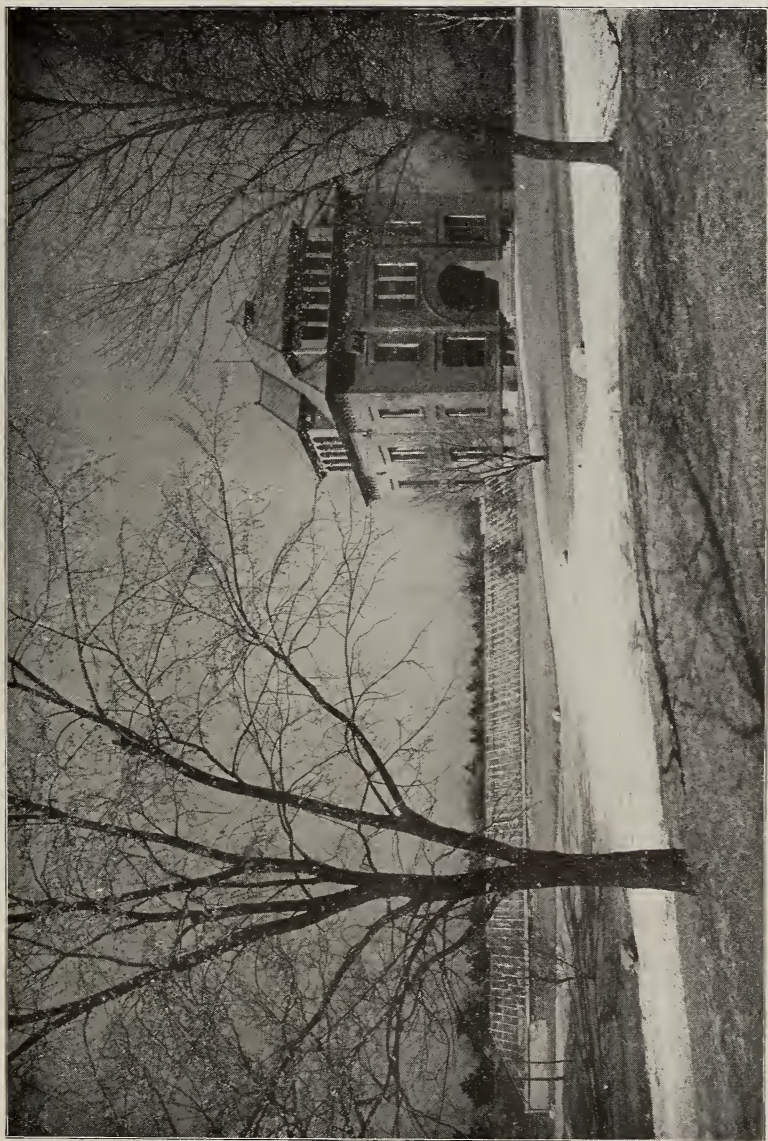
Third Term.—Pomology, Agronomy, Agronomy, French or German.

FOURTH YEAR.

First Term.—Floriculture, Pomology, American History, Economics.

Second Year.—Floriculture, Landscape Gardening, American History, Economics.

Third Term.—Floriculture, Landscape Gardening, American History, Economics.



HORTICULTURAL BUILDING AT O. S. U.

Special advanced courses in horticulture to be elective as the experience and training of the student will warrant.

It is the hope of the writer that a regular ten weeks course in horticulture to correspond to the special course in dairying can be offered during the winter term of 1910 and also that ways and means may be provided for a number of county or local horticultural schools in various sections of the state during the coming year.

Progress in this work along the lines indicated will be seriously hampered without a new building and a plant provided with modern equipment. Great as is the need of a new building it is absolutely essential that proper equipment be provided at once, or certain courses outlined and advertised must be dropped until such time as the

necessary equipment can be secured. In conclusion, work on the gardens, orchards and campus should be planned and conducted in such a way as to be of the greatest usefulness to the instructors and students for laboratories, the matter of revenue from the same, granting reasonable economy in management, being entirely incidental.

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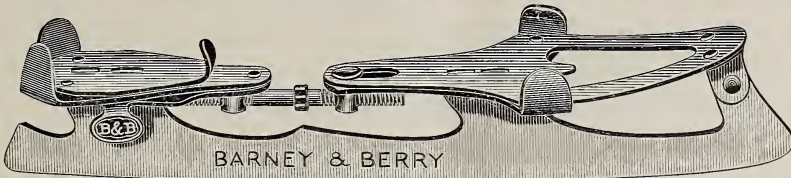
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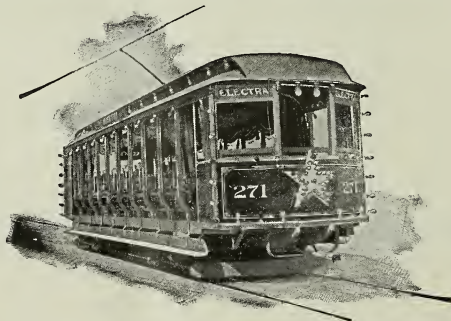
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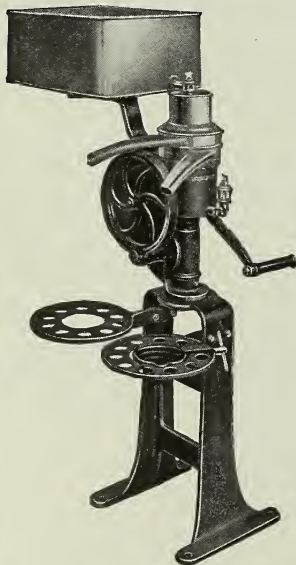
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